

It's time to

plug in

MANITOBA

In our vast province, transportation is vitally important, but collectively internal-combustion-powered vehicles emit the highest proportion of greenhouse gases (GHGs) produced in Manitoba, 39% — almost **seven million tonnes** of GHGs, annually. Cars and light trucks produce most of those emissions. Fortunately, one type of vehicle, the battery-electric vehicle (BEV), doesn't emit greenhouse gases. The battery-electric vehicle is powered entirely by electricity, which is stored in its battery. Manitoba's electricity is some of the world's cleanest. So, as the Manitoba Government resolutely declared, in its Climate and Green Plan,

“Manitoba is an ideal place for the adoption of electric vehicles that plug-in.”

REVOLUTION

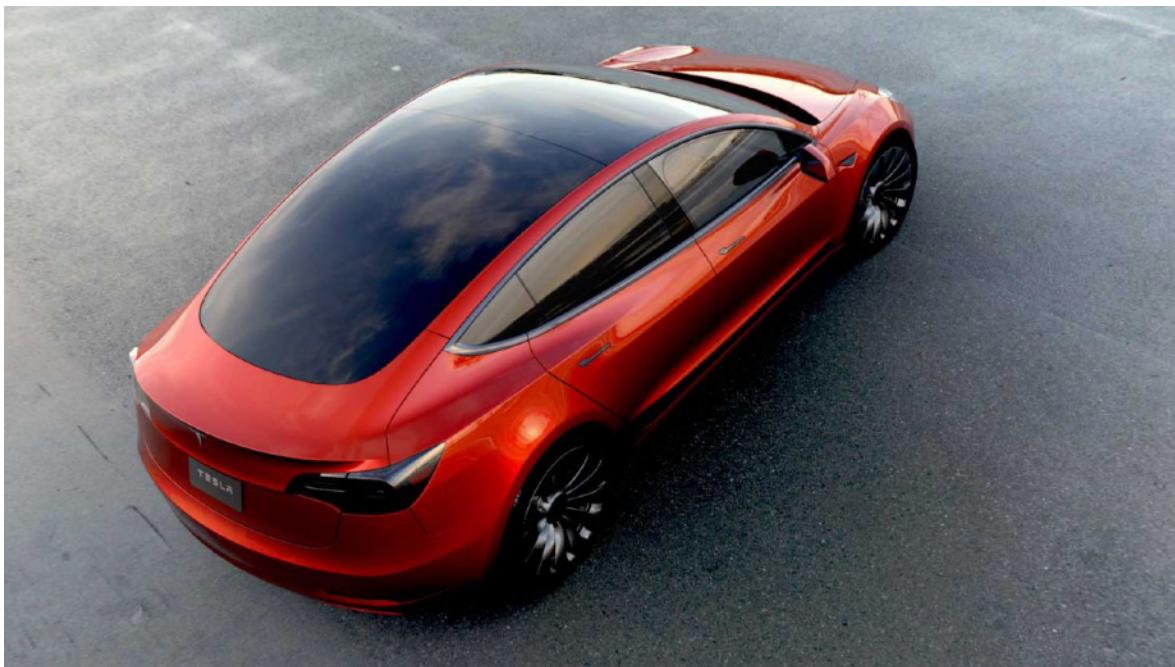
Until recently, only expensive automobiles like Tesla's models S and X were long-range **battery-electric vehicles**, but those BEVs could cost more than \$100,000. Now, all that's changing. Many countries are planning to phase out the sale of **internal-combustion vehicles**, especially **China**, the world's largest auto market. Consequently, auto companies, including **Aston-Martin**, **BMW**, **Citroën** (**Peugeot**), **Daimler-Benz** (**Mercedes**), **Fiat-Chrysler**, **Ford**, **GM**, **Honda**, **Jaguar Land Rover**, **KIA**, **Mazda**, **Nissan**, **Porsche**, **Renault**, **Subaru**, **Suzuki**, **Toyota**, and **Volvo**, are investing more than \$100 billion to produce the second generation of modern battery-electric automobiles. These latest, fully-electric vehicles like the Tesla Model 3 and Chevy Bolt are mid-priced, have greater **range** and charge faster than most of their predecessors.

(Everything highlighted in **green** links to more information.)

Examples of second generation, mid-priced, battery-electric vehicles available now:



Tesla **Model 3**, range: 354 km, (over 500 km, with the larger battery option),



Tesla **Model 3**, base price: \$45,600 CDN;



Chevy [Bolt](#), MotorTrend's [2017 Car of the Year](#), range: 383 km, price: \$43,195 CDN;



Nissan [LEAF](#), price: \$36,798, range: 243 km. [LEAF Plus](#) (spring 2019) range: 364 km. World-wide, more LEAFs have been sold than any other battery-electric automobile.

Cars dominated the first generation of BEVs, but, because of the immense popularity of sport-utility vehicles, it's the battery-electric SUV that's about to take BEVs mainstream. Tesla, KIA, Hyundai and Jaguar have released all-electric SUVs. More are coming in 2019, from Audi, BMW, Mercedes, Porsche, Volvo...



Jaguar **i-PACE S** battery-electric SUV, range 386 km.



Kia **Niro** battery-electric SUV, range: 385 km, has a lifetime warranty on batteries.

"What's over the horizon, maybe 12 to 18 months away, is a Tsunami of 300+ mile (500km) cars."

— talking about the auto industry, January 30, 2019, Ron Kozowski, Manager of Long-Range Strategy and Planning, KIA Motors America. Kozowski says KIA will have cars with "ultra-fast charging".



Hyundai Kona Electric, battery-electric compact SUV, range: 400+ km.

Battery-electric vehicle maintenance and fuel costs are very low. The average four-cylinder, internal-combustion engine has over 130 moving parts, by [comparison](#) the Chevy Bolt electric motor has 3. BEVs have fewer moving parts to wear out or break down; no oil, transmission fluid or radiator coolant to leak; no filters to change; and nothing to tune up. An electric motor is much more efficient than a gasoline engine and [three times as efficient](#) as a diesel engine. The average Manitoba automobile is driven 15,000 km/year. At present MB Hydro rates, [the average BEV uses a miserly \\$300 worth of electricity to drive 15,000 km](#). Therefore, it's not unusual for a Manitoba driver to [save thousands of dollars per year](#) on maintenance and fuel costs after switching to a battery-electric vehicle. That's great news for individuals and [fleet](#) operators.

BEVs perform superbly. The heaviest component of most gas-powered automobiles is the engine, which is centred about half a meter above the road. But most of the weight of an all-electric auto is in its batteries, which are under the seats. So, the BEV has a lower centre of gravity, giving it much greater stability when driving around curves in the road. Also, unlike its gasoline-powered and diesel-powered counterparts, an electric motor delivers 100% torque (full power) to its wheels, instantly, providing unrivalled acceleration. *The Tesla Model 3 sedan accelerates from 0 to 100 km/h in 3.5 seconds!*

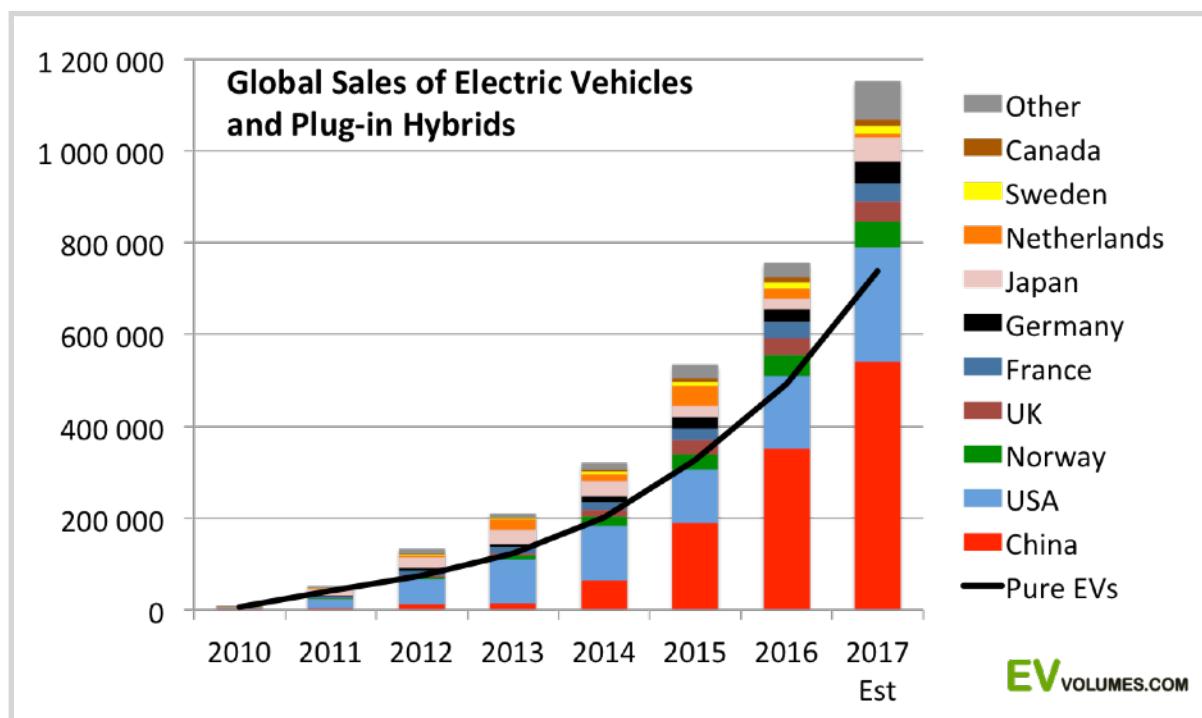
“We believe in an all-electric future...”

— March, 2018, Mary Barra, Chair and CEO of General Motors

Two weeks after the Tesla Model 3's unveiling, almost 400,000 people, including dozens of Manitobans, had each deposited \$1,000 (U.S.) to pre-order that second generation, battery-electric sedan. Tesla's success changed the automotive industry, forever. GM has announced that it will make more than 20 EV models, by 2023; Ford will debut 16 BEVs, by 2022; **Daimler**, maker of Mercedes and Smart cars, will electrify **all its models** by 2022; **Jaguar and Land Rover** will do that by 2020; and, as of 2019, **all** new models of Volvo automobiles will be battery-electric or hybrid-electric.

The entire business of thirty to forty automotive brands will be battery-electric vehicles, within seven to ten years.

—January, 2017, Scott Keogh, President and CEO, Audi USA



(On this graph, the term "Electric Vehicles" means battery-electric vehicles, and the term "Plug-in Hybrids" means plugin hybrid-electric vehicles.)

Sales figures from the first half of last year, strongly indicate that **global plugin vehicle sales surpassed two million in 2018 (a 64% increase over 2017)** led, again, by BEVs.

In 2017, 5% of Americans said their next automobile would be electric. In 2018, **20% of Americans said their next auto would be electric**. As folks discover the **superior handling and performance** of battery-electric vehicles, and the substantial **savings** on fuel and maintenance costs, a growing number are eager to drive these fully-electric vehicles. However, many Manitobans are stopped by two things, the lack of a pan-provincial fast-charge network and the comparatively high purchase prices of BEVs.

LEVELLING THE PRICES

A BEV's most expensive component is the battery, but, as this Bloomberg New Energy Finance graph shows, battery prices are declining yearly. Also, increased production of BEVs is creating economies of scale. Consequently, BEV prices are coming down.



"Electric cars will be cheaper much sooner than expected"

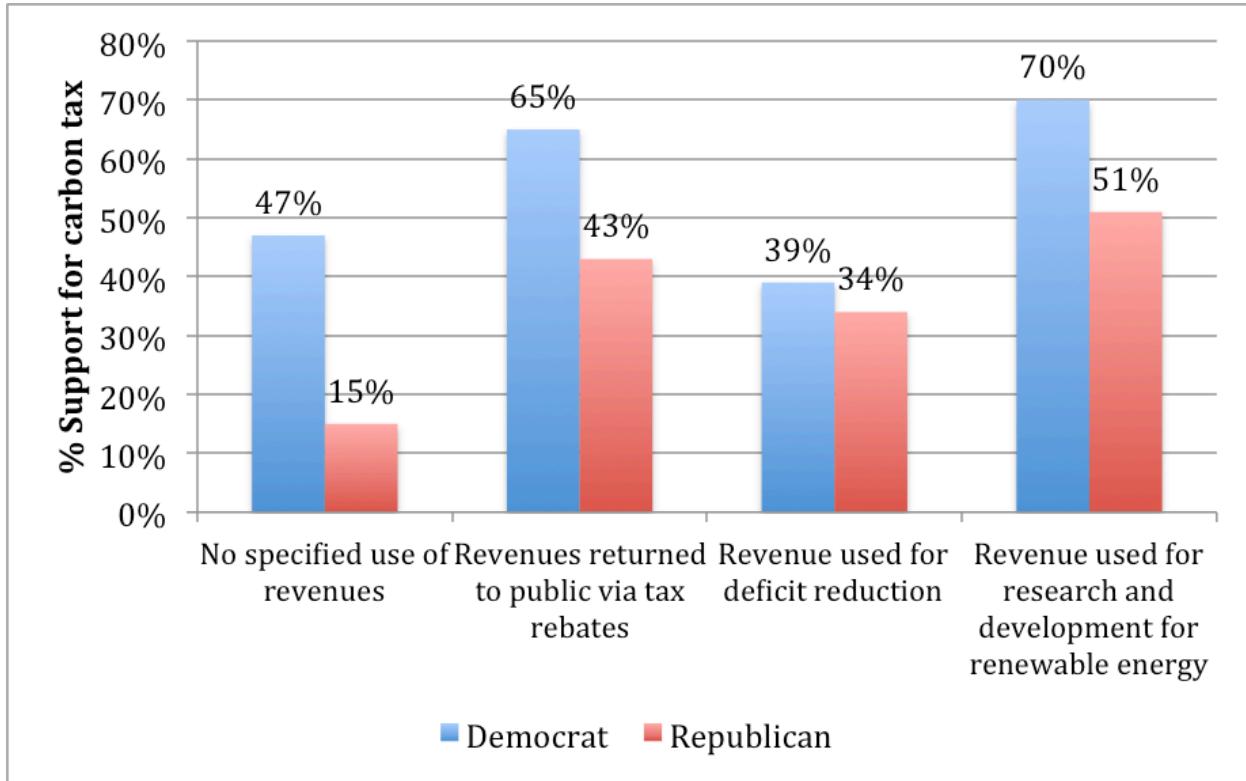
— Forbes, based on a report from the UBS Investment Bank

BEV prices are declining, but for a few years, prices of these emission-free vehicles will continue to be higher than the prices of comparable internal-combustion vehicles. The need to reduce greenhouse gases is urgent. Therefore, around the world, numerous governments are lessening those price differences, by rewarding drivers who switch to BEVs with substantial incentives.

Through programs like the [Manitoba Drilling Incentive Program](#), Canadian taxpayers provide approximately \$3.3 billion in [subsidies](#) to the petroleum industry, annually, but [79% of the petroleum products sold in Canada are burned as transportation fuels](#). Gas- and Diesel-powered cars and light trucks emit most of Manitoba's transportation GHGs.

Our province is capable of using renewable resources to produce much more electricity than we need. Battery-electric vehicles run entirely on electricity. So, our tax incentive programs should enable more Manitobans to choose emission-free vehicles, powered by electricity made in Manitoba.

Various polls in [Europe](#) and the [U.S.](#) make it clear, voters will support special taxes and/or charges on polluters if those tax revenues are spent on furthering the use of “renewable energy”.

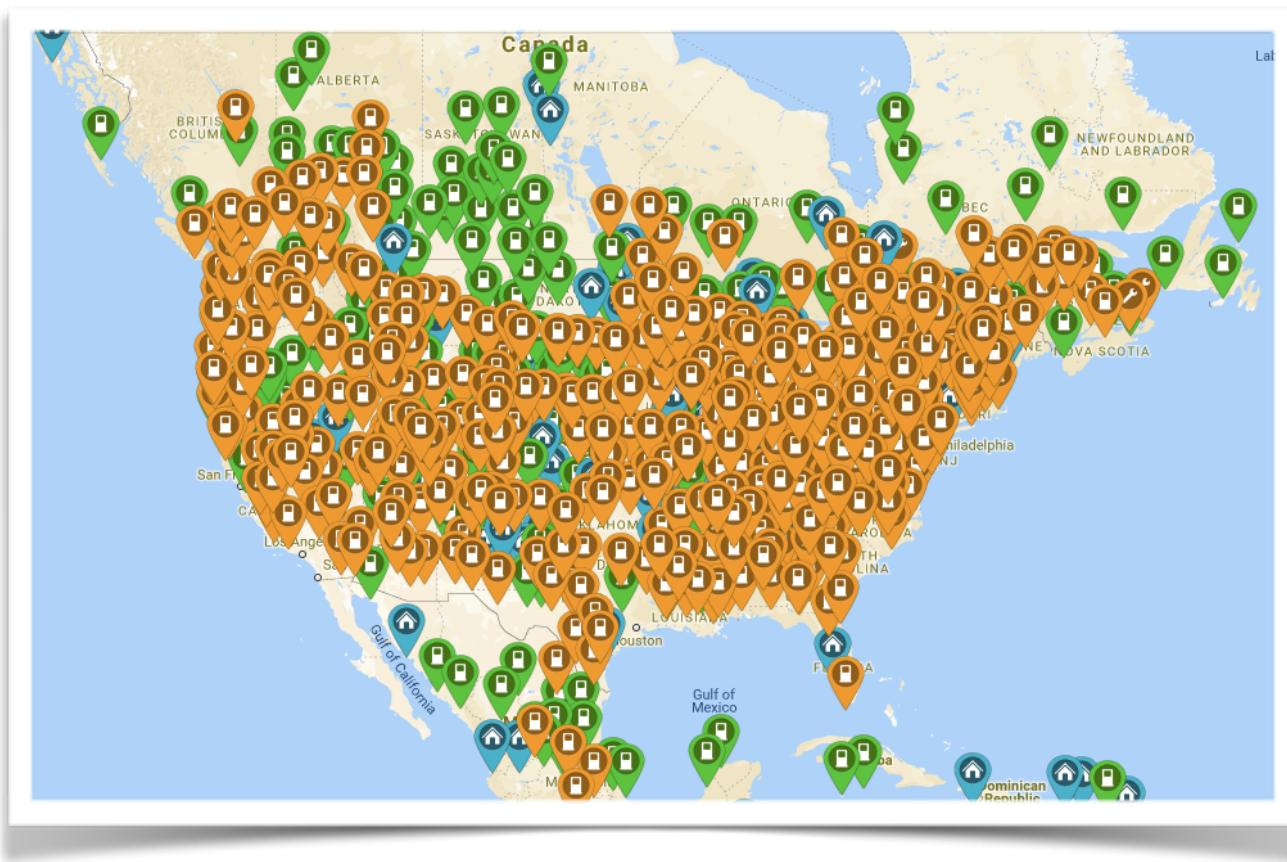


(U.S.) [National Surveys](#) on Energy and Environment

CHARGING EVERYWHERE

Battery-electric automobiles are usually **recharged** at home, using residential chargers. However, on long trips, these BEVs need to be recharged more quickly, at direct-current fast-chargers, also known as level 3 chargers. But the few fast-chargers in Manitoba, are all located in Winnipeg. This lack of fast-chargers beyond the Perimeter Highway makes driving a battery-electric auto seem impractical to many of the Manitobans who drive highways in other regions of the province.

There are over ten thousand charging stations across North America. This map is too small to show all of them, but the presence of an icon indicates that at least one (usually more than one) charging station is located in that region.



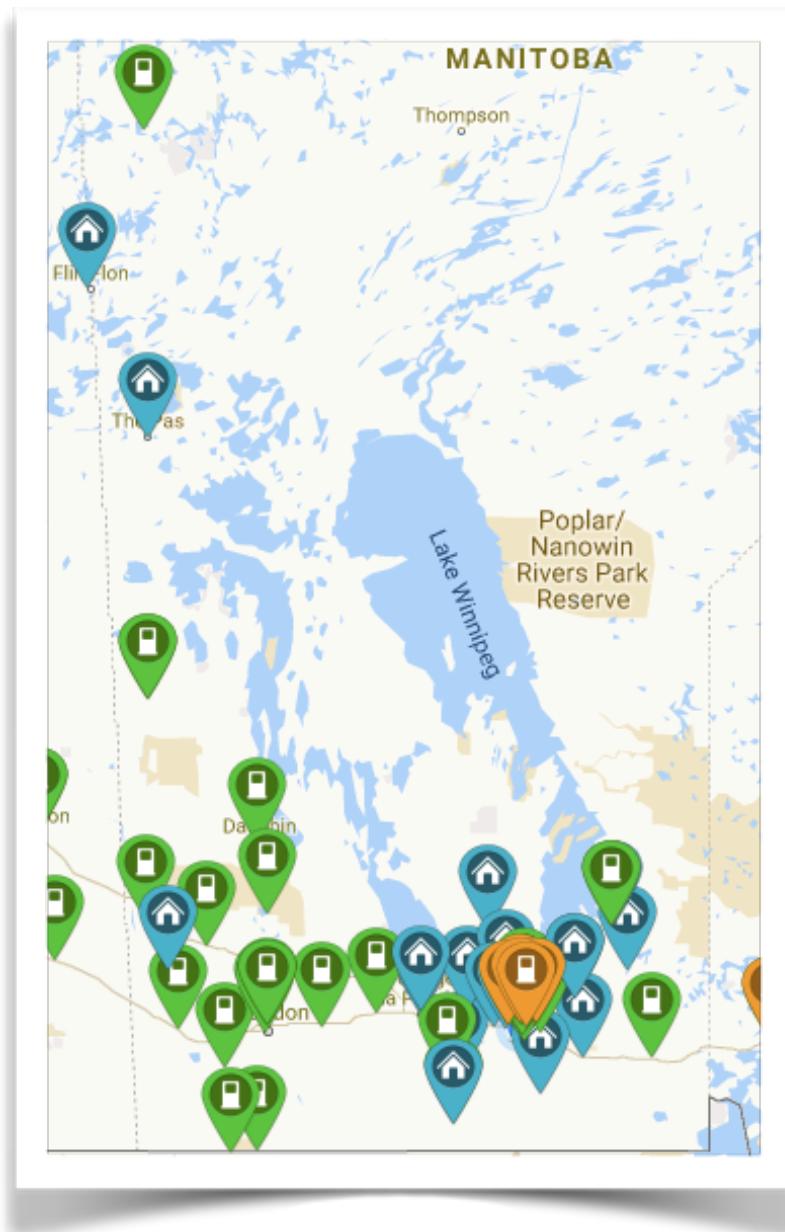
📍 **Fast-chargers**

📍 **destination chargers**

📍 **residential chargers**

Fast-chargers are located throughout the most populous areas of the U.S. and Canada. Manitoba and Saskatchewan comprise the largest gap in this continental network of **fast-chargers**. However, in both provinces, a number of businesses, municipalities and community organizations recognize the potential **benefits** of providing free public access to **destination chargers**. These are usually much slower, much less expensive, level 2 chargers. Also, some folks publicize the locations of their **residential chargers** to make them available, for free, to other plug-in vehicle drivers.

This map shows the locations of the existing **fast-chargers**, **destination chargers** and **residential chargers** in Manitoba.



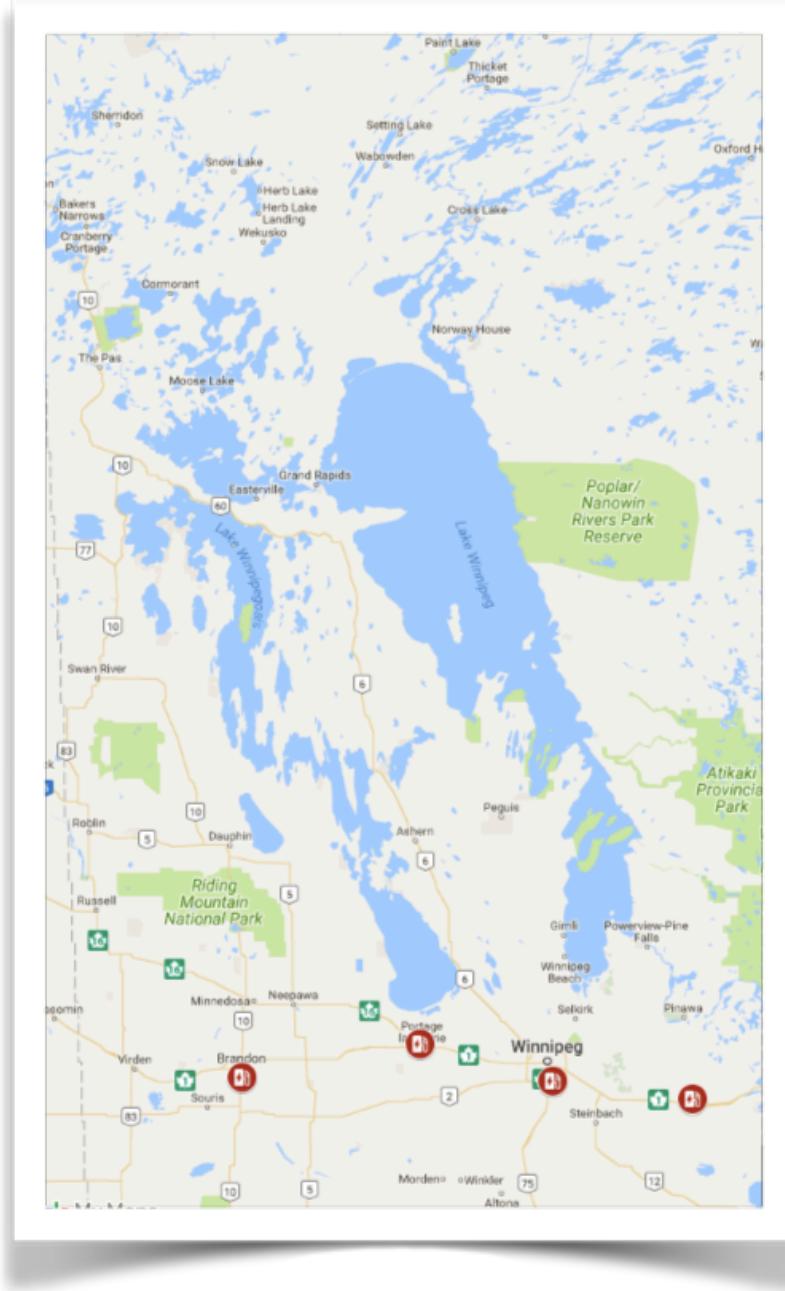
Fast-chargers

destination chargers

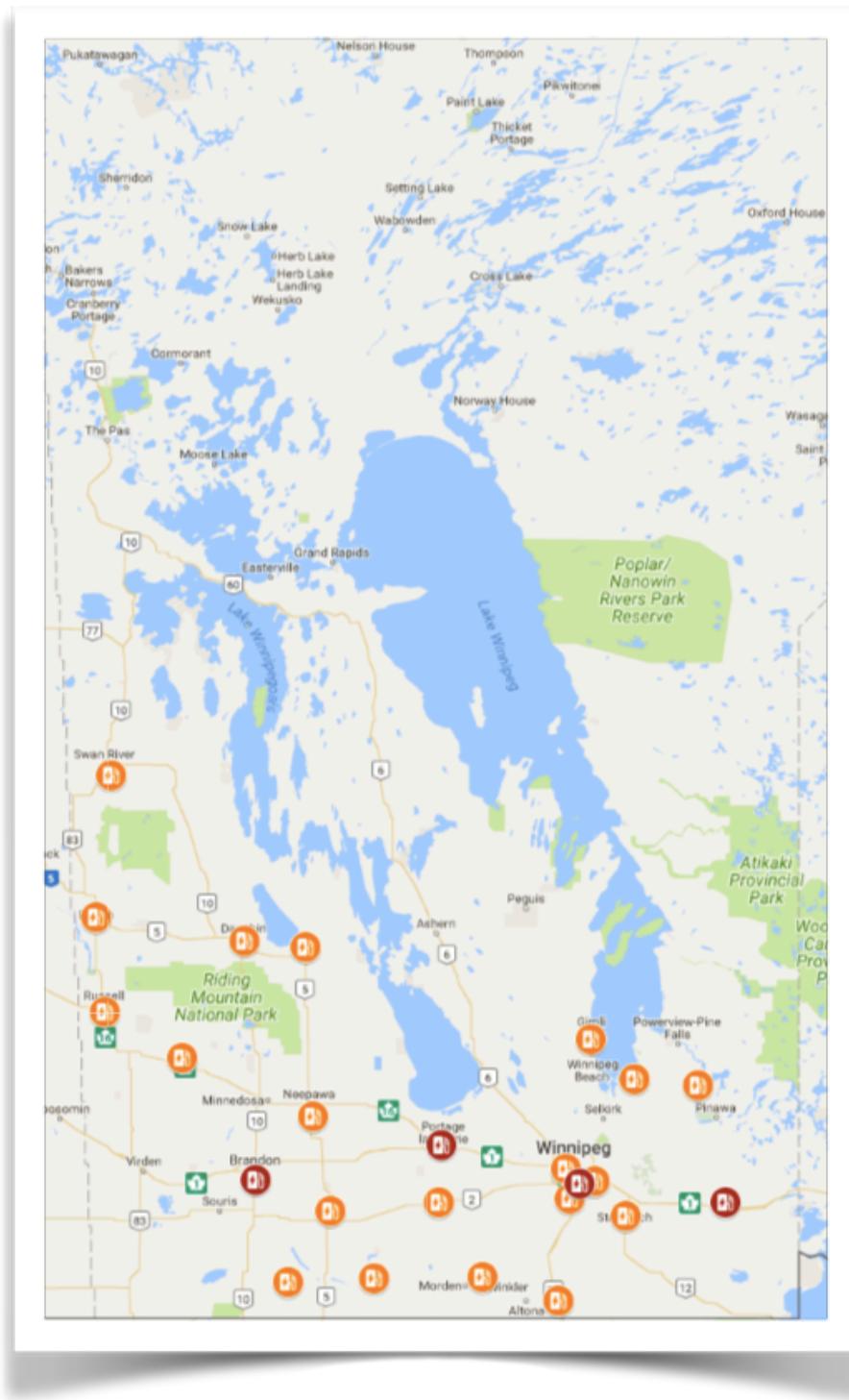
residential chargers

There are over forty **destination chargers** in this province. Seventeen of those chargers are outside of Winnipeg, one as far north as Pukatawagan! The proliferation of **destination chargers** and publicly-accessible **residential chargers** is clear evidence that an increasing number of Manitobans, throughout our province, endorse the switch to electric-powered transportation.

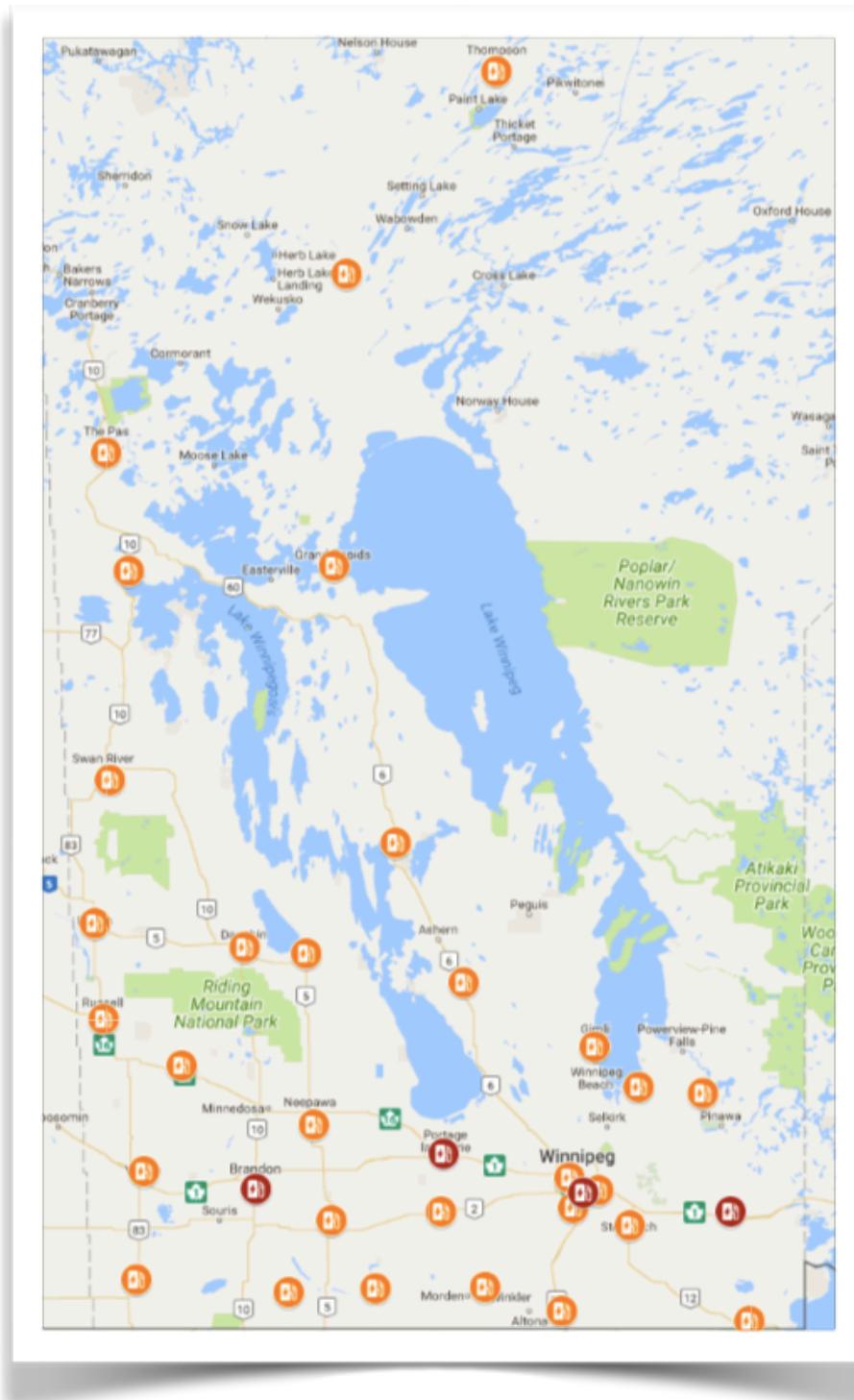
Private companies, supported by Natural Resources Canada, will install fast-chargers along the trans-Canada Highway, in **Brandon, Portage la Prairie, Winnipeg** and the **R.M. of Reynolds**. Excellent! However, to enable all drivers to switch to battery-electric vehicles, access to fast-chargers must be available along major routes in every region of Manitoba.



In some other Canadian provinces, the U.S.A., Europe, China and elsewhere, tens of thousands of EV charging stations have been built and successfully operated by public-private partnerships (P3s). Prairie businesses and some municipalities have expressed interest in such partnerships. By investing in P3s, the Manitoba Government could help create a network of direct-current fast-chargers, throughout this province.



MEVA, the Manitoba Electric Vehicle Association, recommends that, in **2019**, the Gov't of Manitoba invest in P3s, to help fund direct-current fast-chargers in these locations: **Pilot Mound, Killarney, Winkler, Emerson, Glenboro, St. Claude, Steinbach, Lac du Bonnet, Scanterbury, Gimli, Neepawa, Shoal Lake, Russell, St. Rose du Lac, Dauphin, Roblin, Swan River**, and at three more sites near **Winnipeg's** perimeter.



MEVA recommends that, in **2020**, the Gov't of MB invest in growing this province's fast-charge network to thirty locations, including **Melita, Virden, Overflowing River, The Pas, Ponton, Thompson, Grand Rapids, St. Martin Junction, Eriksdale, and Sprague**. These strategically-located fast-chargers would make it possible for drivers to switch to battery-electric vehicles in all regions of Manitoba which are served by provincial routes.

Total cost to install these thirty fast-chargers — less than \$4 million. In B.C., Ontario, Quebec, New Brunswick, Nova Scotia, and Prince Edward Island the costs have been shared by Natural Resources Canada, utility companies, private investors...

If this network were installed soon, Thompson would become the most northern destination on the continent to which BEVs could be driven recharging exclusively with direct-current fast-chargers,

- drawing media attention to the north;
- attracting EV eco-tourists from across North America;
- making Thompson more accessible to BEV product developers as their premier Cold Weather Testing Centre;
- providing potential research, development and training opportunities for the University College of the North...

Within two years, this provincial network would connect Manitobans to North America's expanding fast-charge network. By then, it will cover all of Nova Scotia, New Brunswick, and Prince Edward Island; the most populated areas of Quebec, Ontario, Alberta and B.C.; almost all of the U.S.; and parts of Mexico. Also, North America's plugin vehicle drivers (about 1 million and growing rapidly!) would be able to drive to Manitoba.

LEVERAGING THE SWITCH

Provinces with the Highest Battery-Electric Vehicle Sales:

	2013	2014	2015	2016	2017	'16 - '17 Change	Population
Ontario	622	1,105	1,303	1,486	3,682	148%	13,448,494
Quebec	544	1,109	1,744	2,116	3,653	73%	8,164,361
British Columbia	413	575	1,180	1,303	2,194	68%	4,648,055
Manitoba	12	16	21	26	31	19%	1,278,365

In 2017, 2nd generation modern battery-electric vehicles began arriving in Canada, which spiked the already increasing sales of BEVs in B.C., Québec and Ontario. But, Manitoba sales increased by only five vehicles, the same as the previous two years. At that rate, BEVs would never replace all the internal-combustion autos in Manitoba. In 2017, only 31 Manitobans switched to BEVs. Compared to the per capita rate at which Ontarians switched to BEVs, about 350 Manitobans should have switched; compared to Québécois, about 570 Manitobans should have switched; and compared to British Columbians, over 600 Manitobans should have switched to BEVs, in 2017.

"EV sales will be influenced by how quickly charging infrastructure spreads..."

— 2018 report from Bloomberg New Energy Finance

So, why haven't Manitobans been switching to battery-electric vehicles as quickly as Canadians in B.C., Québec and Ontario? There are two reasons, tax rebates and fast-chargers. Those provincial governments offered tax rebates for each BEV purchase, up to \$11,000 in B.C., \$8,000 in Québec, and \$14,000 in Ontario. However, despite the fact that Ontario's rebates were the most generous, until 2017 Ontario's per capita sales lagged B.C. and Québec. That was because Ontario lacked fast-chargers. For several years, with Natural Resources Canada support, **BC Hydro**, **Hydro-Québec** and their partners had been building provincial networks of fast-chargers. Ontario didn't recognize the crucial importance of access to fast-chargers until 2016. That year, with NRCan support, **Ontario** began contracting with partners to install fast-chargers at 250 locations across southern, central and eastern Ontario. As a result, in 2017, Ontario's BEV sales rose a whopping 148%, outpacing the growth rates of B.C. and Québec combined.

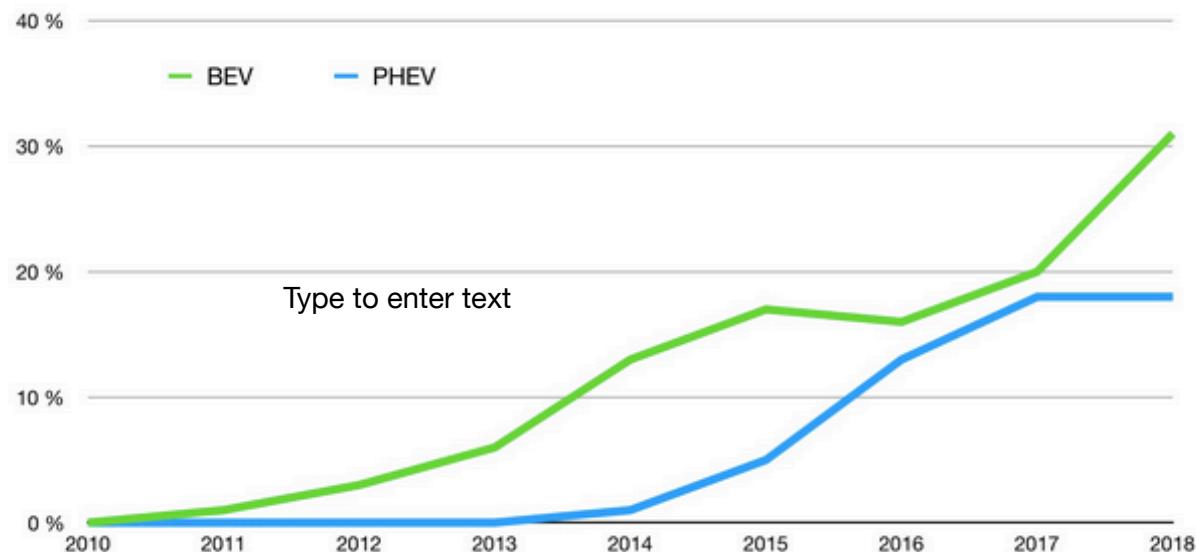
Better access to fast-chargers = more drivers switching to BEVs

"The 30 California cities with the highest electric vehicle uptake have, on average, five times the public charging infrastructure per capita as the U.S. average."

— 2016 report, International Council on Clean Transportation

Since 2017, with support from NRCan, **NB Power** and its partners have installed 15 of 24 fast-chargers in New Brunswick and **Nova Scotia Power** has installed 15. Recently, the **P.E.I. Department of Transportation, Energy and Infrastructure** announced that it will install 6 fast-chargers across the island. Also, the BC Ministry of Transportation and its partners are installing 18 more fast-chargers at ten sites. When they are installed, BC will have 64 fast-charge sites, some with more than one fast-charger. Plans for more fast-chargers to be installed across southern Alberta will soon be revealed.

Market Share of Plugin Vehicles in Norway



Market share of battery electric and plug-in hybrid vehicles sales in Norway – data source elbil.no and ofv.no

In 2016, a Morgan Stanley analyst predicted that 10 to 15% of the world's vehicle sales could be electric, by 2025. The Norwegians, world-leaders in the switch to BEVs, have surpassed that forecast already. In 2018, 31.2% of new automobiles sold in Norway were battery-electric. Norwegian BEV drivers say that is because of the substantial government incentives and easy access to fast-charging. Plugin hybrid-electric vehicle sales levelled off, but still garnered 17.9% of new automobile sales. Therefore, in total, plugin electric vehicles (BEVs and PHEVs) accounted for 49.1% of all new autos sold in Norway, last year.

In places like Norway and California where governments invest in charging facilities and offer tax rebates, drivers switch to battery-electric vehicles at a quicker rate. To be able to compete in those markets, manufacturers offer a wider selection of BEVs. The wider selection enables more drivers to find BEVs that suit their needs, further accelerating the switch to battery-electric vehicles. Almost 6,000 Manitobans drive hybrid-electric vehicles, revealing a strong interest in EVs. If Manitobans had a province-wide network of fast-chargers and were awarded tax rebates for switching to fully-electric vehicles, it's very reasonable to expect that, before long, emission-free, battery-electric vehicles would become as popular here as they are in Norway.

REVING UP DEMAND FOR ELECTRICITY

In the [Manitoba Hydro 2017/18 & 2018/19 General Rate Application](#), the key reason given for increasing electricity rates was a “deterioration in expectations for domestic load growth...”, causing a drop in revenues of about \$110 million per year, by 2027.

In eight years, from 2010-2018, the Norwegian government facilitated BEV sales growth to reach 31.2% of all new auto sales last year. So, over the next eight years, it's reasonable to expect that, within eight years, BEV sales in this province should reach at least 31.2% of automobile sales, if the Manitoba Government invests sufficient revenues to facilitate the switch to BEVs. (These sales projections are probably too modest, because most of the battery-electric vehicles that were for sale in Norway were short-range, very expensive, 1st generation BEVs. The BEVs available now are 2nd generation BEVs, with ranges which are increasing and prices which are decreasing.)

[Manitobans purchase over 40,000 new automobiles annually](#). If just 31.2% of those autos were BEVs, by 2027 over 100,000 automobiles would be powered entirely by made-in-Manitoba electricity. In this province, the [average auto drives 15,000 km/year](#), costing between \$300 and \$350 for the average 2nd generation BEV. Therefore, even at today's electricity rates, by 2027, income from charging over 100,000 BEVs would reduce MB Hydro's projected domestic revenue shortfall by more than \$30 million annually.

Over [783,000 automobiles are registered in Manitoba](#). That number increases at over 5% per year. So, it should probably be greater than 850,000, by 2027. When every auto is battery-electric, the annual income from charging should be over \$250 million. The sooner the MB Government and MB Hydro help drivers switch to all-electric autos, the sooner electricity rates increases can be ameliorated.

“Many provinces have shown that rapid market transformation can happen when governments, utilities and other interested groups support and enable electric vehicle adoption... access to information, support and appropriate infrastructure is fundamental.”

— Government of New Brunswick's Electric Vehicle Advisory Group

In addition to cars and SUVs, many other battery-electric vehicles are being produced now or will be soon: **motorcycles, pickup trucks, vans, delivery vehicles, garbage trucks, transport trucks, buses, farm tractors, mining equipment, construction equipment...**



(c) 2017 - www.lerepairedesmotards.com - crédit photo : David Morcrette

Dozens of companies manufacture battery-electric bikes. This silent, low maintenance, energy-efficient **Zero SR** motorcycle leads the world, but not just in sales; it accelerates from 0 to 100 km/h in 3.3 seconds — 10% are sold to police forces and security companies.

The iconic **Harley-Davidson** will begin producing its battery-electric LiveWire (pictured here) in 2019. Also, **Polaris** plans to electrify the classic Indian motorcycle.



Currently, Workhorse manufactures the **W-15**, plugin hybrid-electric pickup truck, with an all-electric range of 128 km. It can be driven longer distances using an onboard generator, powered by a gasoline motor. Several manufacturers are competing to produce the world's first fully-electric pickup truck. Tesla is one of the main contenders, but the winner may be manufactured in Ontario, by a new company, Havelaar.



Havelaar **Bison** all-electric pickup (range: 300+ km) **designed and tested** in Canada.



Zenith battery-electric urban cargo vans.



Every time this full-sized, side-loading, **BYD battery-electric garbage truck** stops, it regenerates its own electricity, making it especially economical to operate.



A class 7, heavy duty hauler demonstrating the **Cummins electric powertrain**.



Tesla battery-electric semi-transport truck, range options: 475 kms or 800 kms.



Presently, prototypes of **Tesla's battery-electric transport trucks** are ferrying parts between its factories in California and Nevada. This EV goes into production in 2019. Customers include Pepsi, Walmart, Anheuser-Busch, Real Canadian Superstores...

School buses don't typically travel long distances. Therefore, battery-electric school buses can be fully recharged (using the same level 2 chargers as other BEVs) after morning and afternoon runs — ideal vehicles to be entirely powered by electricity.



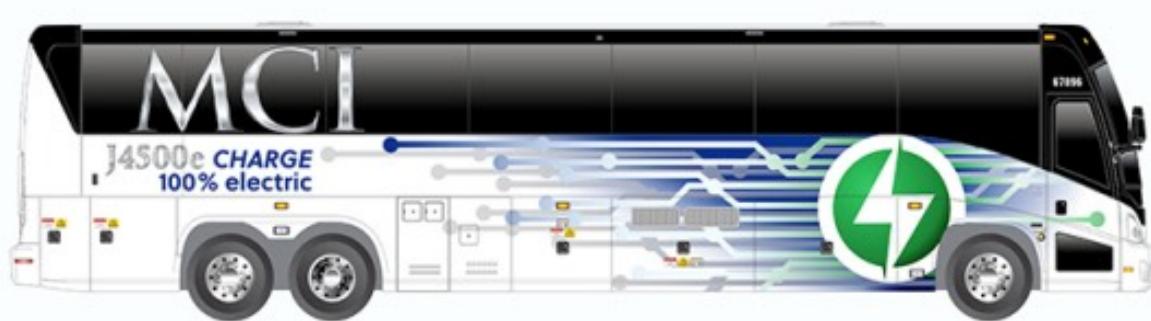
eLion battery-electric school bus is North America's first type C, fully-electric, school bus. Its engine has as much or more power than school buses which use diesel engines, enabling the eLion to transport up to 72 students, without producing any harmful emissions.

The eLion can be equipped with one of several battery configurations, providing ranges from 100 - 250 km, more than enough for school routes and most other school trips.

Lion Buses, of St. Jérôme, Québec, sells more electric school busses than all other companies combined. The eLion was developed with assistance from the Québec Green Fund — a great investment of provincial tax revenues!

Blue Bird Type C and D battery-electric school buses (range 160 -190 km) use a variant of the drivetrain which has successfully logged over 3.2 million km in electric semi-trucks and electric heavy duty trucks around the world. Deliveries of these all-electric school buses start this fall.





MCI J4500e battery-electric highway coach has successfully completed phase 1 tests. Dozens of **companies** around the world are racing to win in this lucrative market.



Model 650, one of seventeen battery-electric **Zamboni** resurfacing machines that maintained all the ice surfaces at the 2018 Olympics.

Internal-combustion-powered ice-resurfacing machines spew **invisible air pollutants**, such as carbon monoxide, nitrogen dioxide and ultra-fine particulates, all of which are **detrimental to the health** of athletes, staff and spectators, especially youth, seniors and those who have cardio-pulmonary disorders. To solve this, **most ice-resurfacer manufacturers now offer emission-free, battery-electric models**.

Clean ice. Clean air. Clear choice.

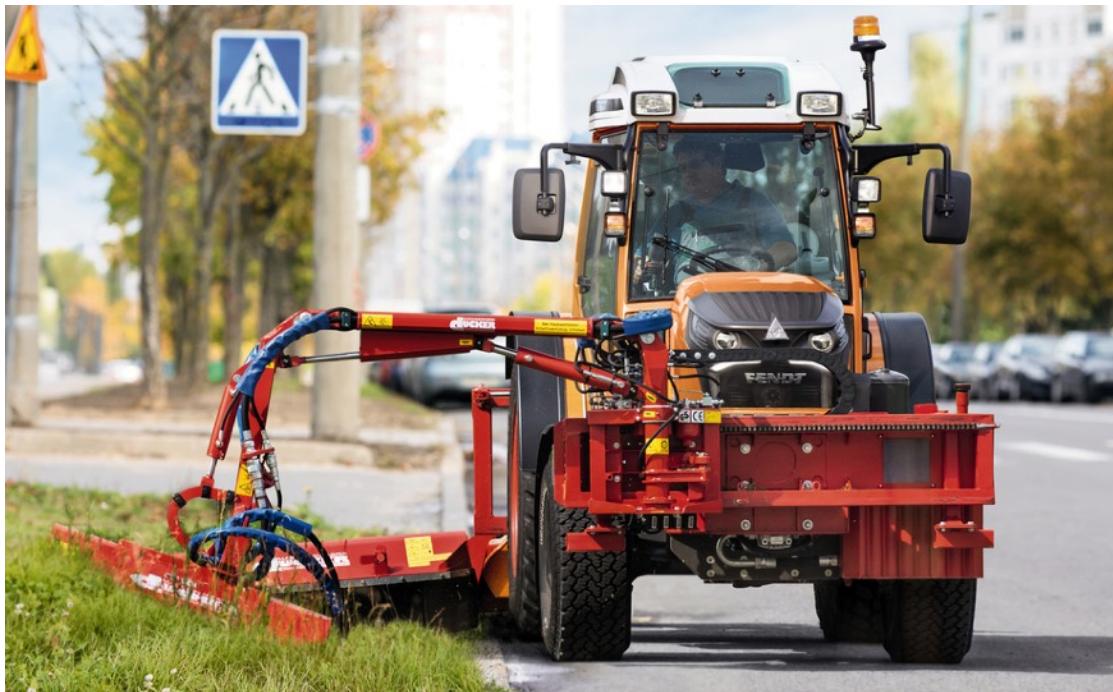
— a battery-electric Zamboni advertisement

Electric construction equipment, “...the future of our industry.”

— Ahcène Nedjimi, Lead Engineer, VolvoCE EX2 Project



Green Machine **e135** battery-electric excavator.



Fendt **e100 Vario** battery-electric compact tractor (pictured is the municipal version)

“the first viable farm tractor with battery power.”

— Fendt



John Deere **battery-electric farm tractor**



Atlas Copco Scooptram ST7 battery-electric mining load-haul-dump (LHD)

"Our customers' future is electric."

— Andreas Nordbrandt, Pres., Underground Rock Excavation Division, Atlas Copco

Some **electric planes** are currently in production, several others are being developed.



For U.S. flight schools, this **Aero** Electric Aircraft Corporation **Sun Flyer 2**, battery-electric plane, is capable of reducing fuel costs from \$35 per hour to \$1 per hour.



Eviation intends to fly this nine passenger, battery-electric commuter airplane by 2021.

This is just a sampling of battery-electric-powered vehicles. Many others, including more automobiles, will be available quite soon. If the Government of Manitoba immediately makes investments which facilitate the switch to BEVs, **income derived from charging all types of battery-electric vehicles could entirely eliminate Manitoba Hydro's projected domestic revenue shortfall**, well before the end of the next decade.

MEVA RECOMMENDATIONS

The Manitoba Electric Vehicle Association is making these recommendations to the Government of Manitoba based on MEVA members' own experience and measurably successful strategies in Québec, Ontario, British Columbia, and many other locations around the globe, especially the world leaders, Norway and California.

1. **Invest in private-public partnerships to create a network of strategically-located, fast-charge stations, throughout this province.**

Battery-electric vehicles are usually recharged slowly at home, using level 2 chargers. But on long trips BEVs need to be recharged rapidly. That's why, in B.C., Ontario, Québec, New Brunswick, Nova Scotia and Prince Edward Island utility companies and other partners are installing province-wide networks of level 3 quick chargers. By investing, with the private sector, in a pan-provincial network of strategically-located, fast-charge stations, the MB government would enable many more Manitobans to reduce carbon emissions by switching to fully-electric cars, SUVs, trucks, and more.

2. **Incentivize builders to install the wiring to make all new parking facilities EV ready, especially for new single-unit and multi-unit residential housing.**

Being EV ready makes it relatively simple and inexpensive to install level 2 chargers at a later date, at each parking stall, as demand grows. It's cheaper than retrofitting.

3. **Provide additional incentives to offset the extra costs associated with the installation of level 2 charging equipment at existing parking facilities, especially for residential housing units.**
4. **For a few years, until battery-electric vehicles are more affordable, reward Manitobans who purchase or lease emission-free, battery-electric vehicles with substantial tax rebates.**

Canadians subsidize the petroleum industry at a rate of \$3.3 billion annually. Taxpayers subsidize that industry locally through the Manitoba Drilling Incentive Program. Manitobans who wish to reduce carbon emissions by switching to BEVs deserve tax incentives, too.

5. **Eliminate sales taxes on the cost of all parts needed to convert internal-combustion-powered vehicles to electric power.**

6. In its Climate and Green Plan, the MB Government declares its intention to “lead by example”. To accomplish this, the Government should purchase or lease only battery-electric vehicles for government and crown corporations, and install level 2 chargers (a.k.a. destination chargers) for those vehicles.

The MB Gov’t. Vehicle and Equipment Management Agency manages approximately 2600 vehicles, which use tens of millions of litres of fuel per year. Many could be battery-electric, which would save the Manitoba Government over a hundred million dollars in fuel and maintenance costs annually, and result in enormous reductions in GHGs. Those benefits would motivate other fleet operators to switch to battery-electric vehicles, too. (Wpg. Fleet Management Agency manages approximately 1700 vehicles.)

7. Enable school divisions to switch to battery-electric school buses.

Air inside the average school bus is 700% more polluted than outside. Manitoba’s 2400 school buses use tens of millions of litres of fuel per year. Switching to battery-electric school buses would be much healthier for students, and save Manitobans over a hundred million dollars in fuel and maintenance costs annually.

8. Invest in the deployment of battery-electric buses for public transit.

Many small towns and very large cities across North America are proving that it has become technically, operationally and financially feasible to operate battery-electric buses. In 2017, 386,000 e-buses were in service, around the globe. Bloomberg New Energy Finance predicts that will grow to 1.2 million e-buses by 2025 — within seven years, 47% of the world’s transit buses will be electric. It’s time to end the purchase of internal combustion transit buses in Manitoba. If others can do it, so can we.

9. Include elected representatives from Manitoba’s EV community on all boards and committees making transportation policies, plans and decisions.

Governments in Norway, California and other locations have discovered that, to accelerate the switch to BEVs, it’s essential to have effective partnerships with their electric vehicle associations. There is a wealth of experience and expertise within the Manitoba Electric Vehicle Association. Plug in to this resource.

10. Partner with the Manitoba Electric Vehicle Association in the development and implementation of an effective, community-based, BEV public awareness campaign.

Getting positive answers, from local battery-electric vehicle drivers, helps people feel more confident that switching to a BEV would be an excellent choice for them, too.

REVIEW

Transportation is the source of 39% of Manitoba's greenhouse gas emissions. **Internal-combustion motors in cars, SUVs and light trucks emit most of those pollutants.**

In its Made-in-Manitoba Climate and Green Plan, the Manitoba Government stated that "**One of the greatest opportunities for reducing transportation emissions is through electrification.**" Indeed, expediting the electrification of motor vehicles could hasten the elimination of that large source of greenhouse gases.

Tax incentives would enable more Manitobans to choose emission-free, battery-electric transportation, but incentives alone won't be sufficient. Statistics reveal that rebates and other incentives help some drivers switch to BEVs, but most drivers won't switch to these fully-electric vehicles, unless they have easy access to fast-chargers for long-distance travel. For that reason, more and more governments are facilitating the installation of fast-charge stations by utility companies and the private sector. The effectiveness of combining incentives with easy access to fast-charging has been proven in Norway, where one third of the new autos sold are battery-electric vehicles. Closer to home, despite offering the most generous incentives in Canada, Ontario's per capita sales of BEVs lagged those of British Columbia and Québec, because those provinces had more fast-chargers. When the Ontario Government facilitated installation of a network of fast-charge stations, BEV sales increased 148%. So, investing in a pan-provincial network of fast-chargers is essential if the Government of Manitoba is going to achieve the greatest reduction of transportation emissions through electrification.

In addition to drastically reducing greenhouse gas emissions, investing in transportation electrification would yield incomparable economic benefits. For instance, Manitobans would save hundreds of millions of dollars every year on fuel and maintenance costs. Also, instead of importing billions of dollars worth of gasoline and diesel fuel annually, vehicles would be re-charged with made-in-Manitoba electricity.

Our Government's Climate and Green Plan resolutely declared that "**Manitoba is an ideal place for the adoption of electric vehicles that plug-in...**" Absolutely! For years, members of the Manitoba Electric Vehicle Association have been driving battery-electric cars, trucks, SUVs and motorcycles, proving that, in the true north, electric motors are superb replacements for those internal combustion engines which are fouling our air.

Last year, Premier Pallister touted Manitoba's record as "a clean, green province." Then, he bluntly told us, "It's time to do even more... Climate change is real and it's already impacting us... it poses a growing threat to how we live and work." Since then, the rapidly increasing frequency and severity of wildfires, floods, droughts and other catastrophes around the globe is warning us that we are quickly running out of time. Therefore, we urge the Manitoba Government to implement MEVA's recommendations, without delay. Partner with Manitoba's EV community, the private sector and other levels of government now, to expedite the electrification of transportation. As the Premier said, a year ago, "It's time..."